APPENDIX B: TRAFFIC ANALYSIS

To: Nicole Tolley

From: Matt Horrocks

Date: May 16, 2005

Subject: Pleasant Grove Railroad Bridge Traffic Operations Analysis

HORROCKS ENGINEERS

MEMORANDUM

Purpose

The purpose of this memorandum is to document the traffic operations analysis for the Pleasant Grove Railroad Bridge and State Street widening project. This memo includes traffic operations analysis for the existing traffic conditions and the projected 2020 traffic conditions for intersections located within the project area. 2020 Travel demand for alternatives considered for evaluation were calculated. In addition, 2020 intersection operations for the recommended alternative were determined and are provided in this memorandum.

Project Summary

The Pleasant Grove Railroad Bridge and State Street widening project is to widen the bridge and State Street to accommodate three lanes of traffic in each direction. The bridge and State Street currently accommodates only one lane of traffic in each direction. Significant delay times presently exist in the project area due to the restricted travel lanes.

Procedures

Traffic Data

Traffic counts and turning movement data was obtained for intersections within the project study area. From the turning movement traffic counts, it was determined that the AM peak hour occurs between 7:30 am and 8:30, the PM peak hour (also the one-hour peak period) occurs between 4:45 pm and 5:45 pm. From this data, existing AM and PM peak hour traffic volumes were generated and 2020 traffic volumes were projected using Synchro modeling software program. Figure 1 shows the existing AM peak hour traffic volumes and Figure 2 shows the PM peak Hour traffic volumes.

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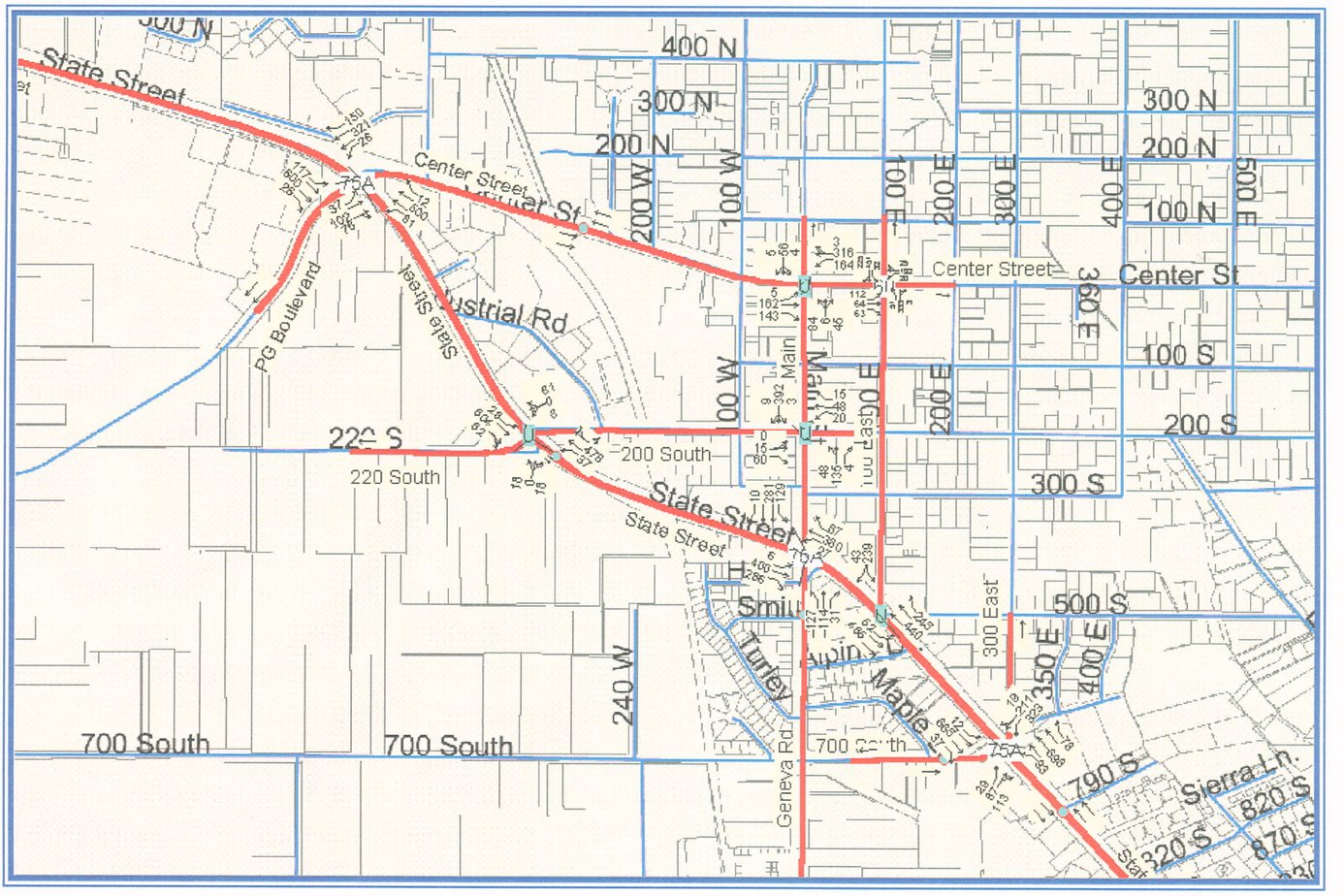

Figure 1: AM Peak Hour Volumes

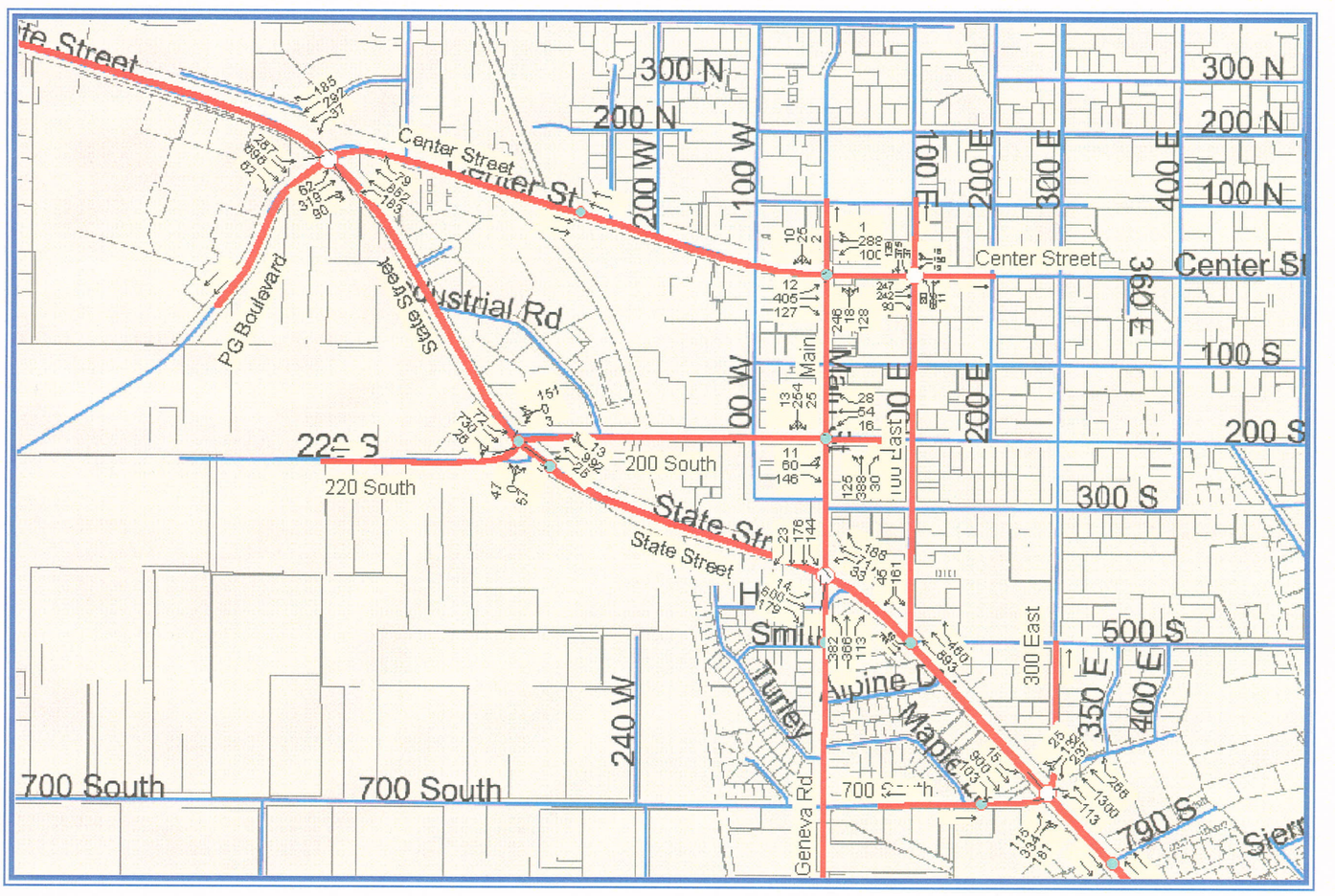

Figure 2: PM Peak Hour Volumes

Alternatives Considered for Evaluation
Alternatives considered for evaluation include:

No-Action
Improve Parallel Corridors (Widen 200 South and 700 South to 5-lane typical section)
Widen State Street to 5-lane typical section
Widen State Street to 7-lane typical section

Alternatives were evaluated under 2020 capacity restrained conditions.

Traffic Volumes
Traffic volumes were determined using the MAG/WFRC version 4.2 Long Range Plan Model. Under 2020 conditions, this model assumes that I-15 has been widened to five-lanes each direction and commuter rail has been constructed. Results of the traffic analysis are provided in Table 1.

Table 1: Year 2020 Traffic Volume Analysis

Alternative	2020 Conditions			
	State St. - Lindon to 100 E. P.G.		State St. - 100 E. to 200 South	
	Volume (vpd)	V/C	Volume (vpd)	V/C
No-Action	30,850	0.69	24,500	1.22
Improve Parallel Corridors	31,025	0.69	24,500	1.22
5-Lane State Street	32,350	0.72	28,900	0.64
7-Lane State Street	30,800	0.53	30,800	0.53

Traffic Operations Analysis
Existing traffic conditions and projected 2020 traffic conditions were determined for the signalized intersections within the project area. Three signalized intersections on State street were analyzed to determine AM and PM peak traffic volumes, traffic delay times, and levels of service (LOS) . Table 2 shows the average AM Peak delay times for the three intersections. For the AM Peak hour, all intersection were determined to operate at LOS B. In addition to the AM peak, Table 2 shows that the PM Peak hour traffic delay time increases at each intersection with the longest delay of 59.1 seconds occurring at the intersection of State Street and Geneva Road. For the PM peak hours the three intersections drop to LOS C with the exception of the State Street and Geneva Road intersection which drops to LOS E.

Table 2: Intersection Operations - Existing AM and PM Peak.

Intersection	Existing Conditions			
	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
P.G. Boulevard & State Street	18.4	B	24.9	C
Geneva Road & State Street	16.4	B	59.1	E
300 East & State Street	17.0	B	33.0	C

Table 3 shows the projected 2020 conditions for the three study intersections on State Street with and with out improvements to the traffic delay times. If no improvements are implemented the traffic delay times are projected to increase significantly, with all intersections operating at a level of service E or worse. Queues from the State Street and Geneva Road intersection are significant enough, in the 2020 no improvements scenario, that delay at the remaining intersections increase. Under the 2020 with improvements scenario, the State Street and Geneva Road intersection is the only study intersection to receive improvements. These improvements substantially decrease the delay to all three intersections. Under the 2020 with improvements scenario, it is expected that all study intersections will operate with a level of service D or better.

Table 3: Year 2020 Intersection Operations - No Improvements and Improvements.

Intersection	2020 Conditions			
	No Improvements		With Improvements	
	Delay	LOS	Delay	LOS
P.G. Boulevard & State Street	>100	F	41.2	D
Geneva Road & State Street	>100	F	44.4	D
300 East & State Street	55.2	E	27.3	C

Recommendations

The Operations Analysis indicated that without improvements to the State Street bottleneck and State Street Geneva Road intersection, traffic delays will continue to get longer in the project area. Improvements to the traffic delay time can be made by widening State Street at the Pleasant Grove Railroad Bridge and providing improvements to the State Street and Geneva Road intersection. These improvements consist of additional through-lanes and longer right- and left-turn lanes. Figure 3 shows the recommended reconfiguration of the State Street and Geneva Road intersection.

Figure 3: Recommended Improvements to State Street and Geneva Road Intersection.

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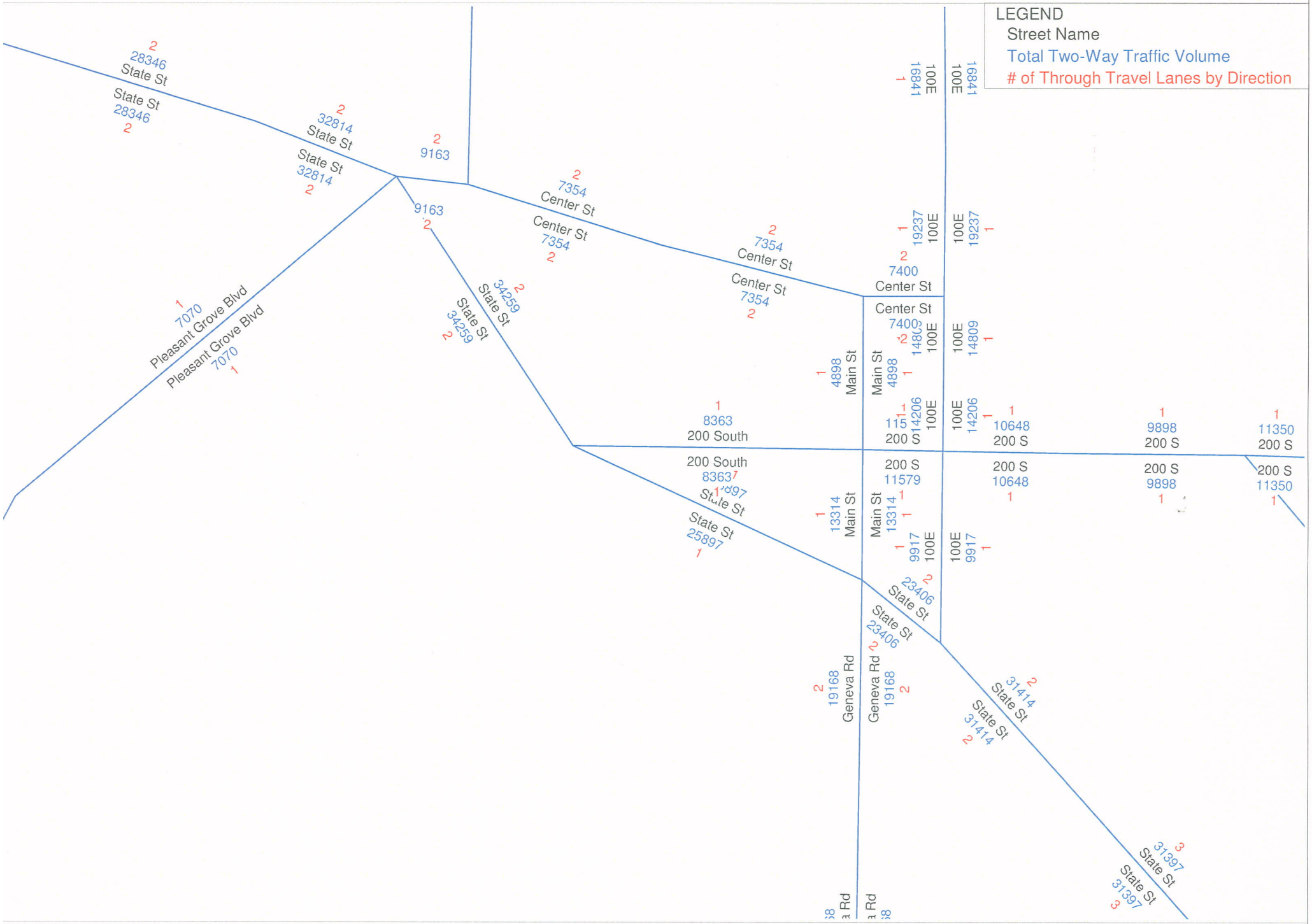
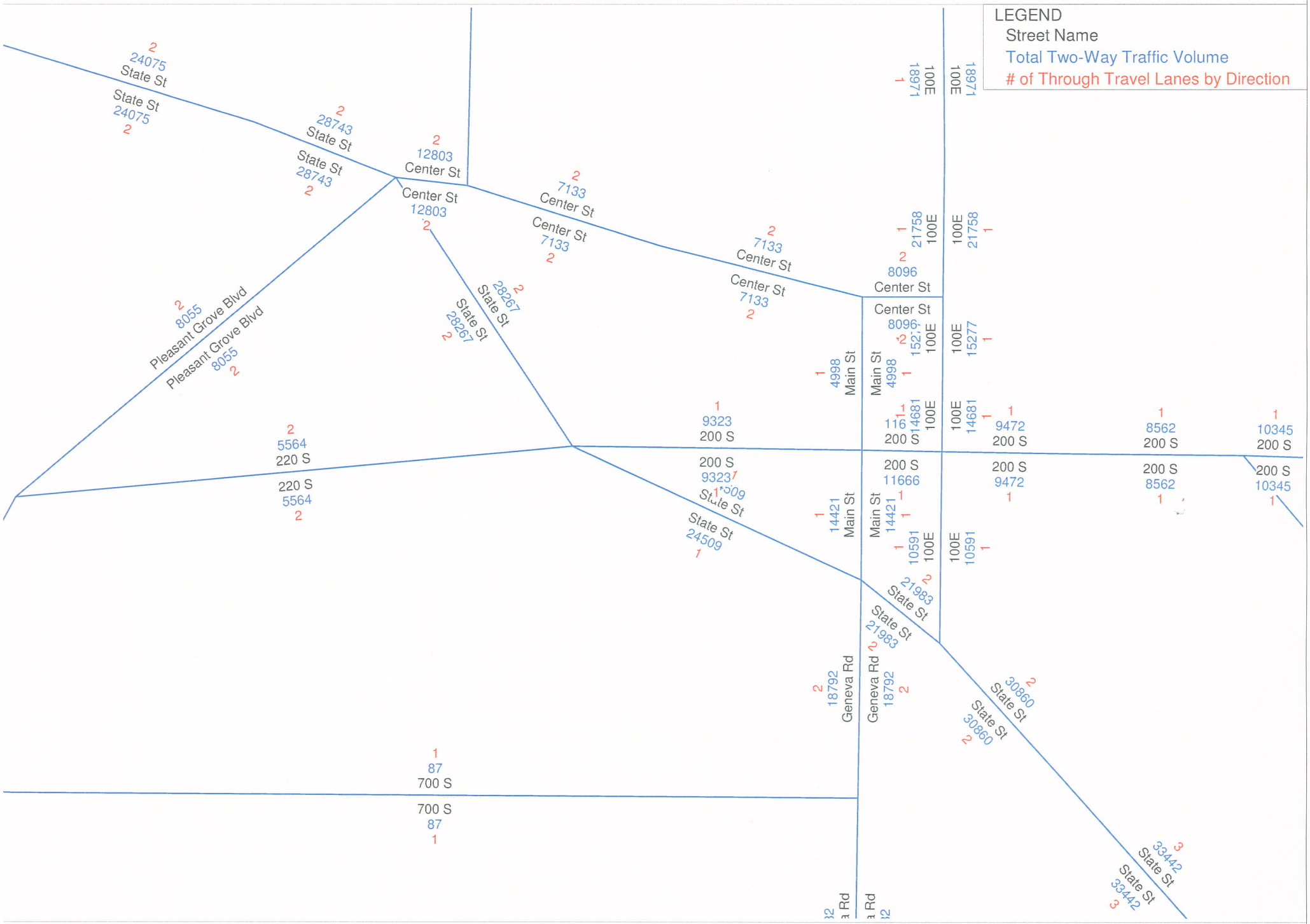
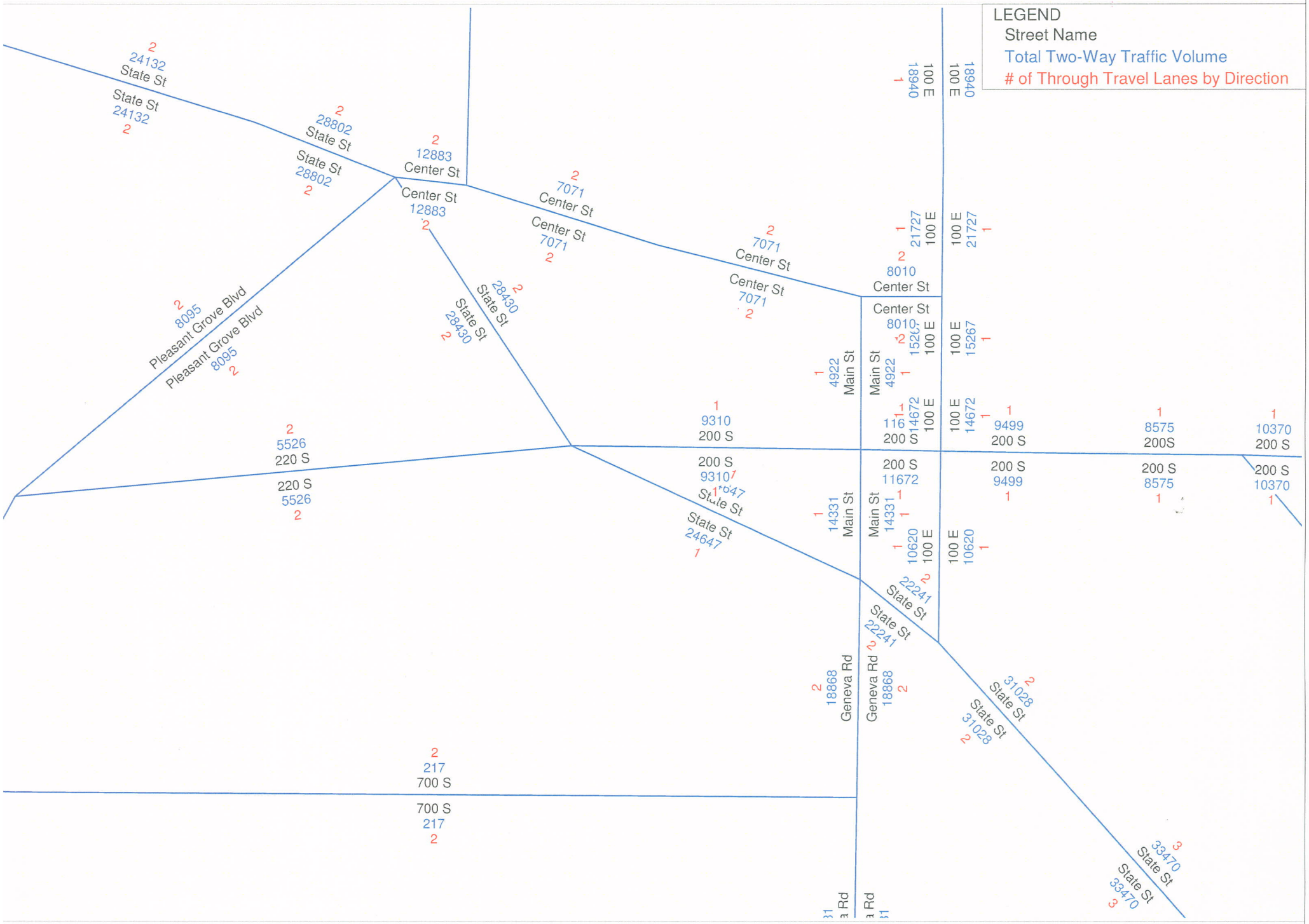
2004/2005 Average Daily Traffic Volumes (ADT)
MAG 2004/2005 Travel Demand Model



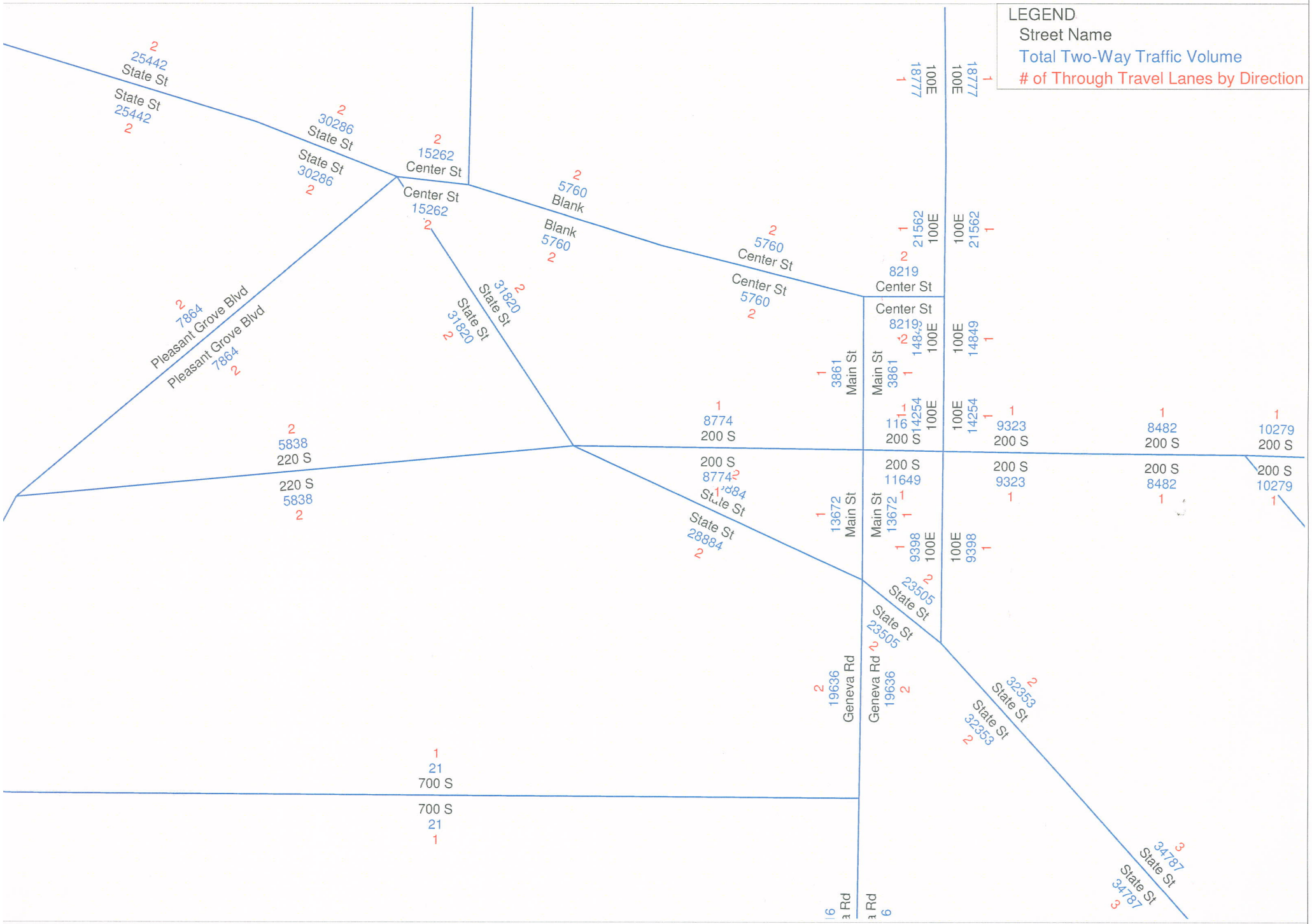
2020 Average Daily Traffic Volumes (ADT) with Existing State Street
MAG 2020 Travel Demand Model



2020 Average Daily Traffic Volumes (ADT) with Existing State Street & 5 Lane 700 South
MAG 2020 Travel Demand Model



2020 Average Daily Traffic Volumes (ADT) with 5 Lane State Street
MAG 2020 Travel Demand Model



2020 Average Daily Traffic Volumes (ADT) with 7 Lane State Street
MAG 2020 Travel Demand Model